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1.0 PURPOSE

This procedure establishes the implementing instructions to be used with vendor-supplied Process Control Plans (PCP's) and High Integrity Container (HIC) dewatering procedures, and implements the surveillance requirement of Technical Specification 16.4.11.3 (Draft) for processing of radioactive waste.

2.0 REFERENCES

2.1 FSAR 16.3.11.3 (Draft)

2.2 FSAR 16.4.11.3 (Draft)

2.3 HP-1-101, ALARA Program Implementation

2.4 OP-7-006, Solid Waste Management

2.5 OP-7-005, Resin Waste Management, Rev. 1

2.6 PMD-RW-001, Radioactive Waste Management, Rev. 1

2.7 Chem-Nuclear Systems, Inc., SD-OP-003, Process Control Plan for CNSI Cement Solidification Unit, Rev. N

2.8 Chem-Nuclear Systems, Inc., FD-OP-23, Bead Dewatering Procedure for CNSI 14-195 or Small Liners

2.9 Chem-Nuclear Systems, Inc., DM-OP-13, Dewatering Bead Resin in Plastic Liners

2.10 Hittman Nuclear Development Corp., STD-P-05-003, Process Control Program for Incontainer Solidification of 10 to 14 Weight Percent Boric Acid, Rev. 1

2.11 Hittman Nuclear Development Corp., STD-P-05-004, Process Control Program for Incontainer Solidification of Bead Resin, Rev. 1

2.12 Hittman Nuclear Development Corp., STD-P-03-005, Dewatering Hittman Radlok Containers with Flexible Underdrains to Less Than 1% Drainable Liquid, Rev. 2

2.13 Hittman Nuclear Development Corp., STD-P-04-002, Dewatering Ion Exchange Resin and Activated Charcoal Filter Media to 0.5% Drainable Liquid

2.14 RW-2-320, Radioactive Waste Inventory and Material Control, Rev. 1

2.15 UNT-5-002, Condition Identification and Work Authorization

2.16 HP-1-110, Radiation Work Permits

3.0 PREREQUISITES

3.1 A CIWA has been processed in accordance with UNT-5-002, Reference 2.15.

3.2 An RWP has been issued for the waste processing activities in accordance with HP-1-110, Reference 2.16.

3.3 Applicable vendor equipment and personnel are available.

3.4 An ALARA prejob briefing session has been conducted with applicable personnel in accordance with HP-1-101, Reference 2.3.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Contamination control devices shall be installed on temporary hose or line fittings.

4.2 Disposal liner level indication devices shall have satisfactorily passed preoperational checks.

4.3 Maximum allowable liner weight limits have been determined and shall not be exceeded.

4.4 If required, any modification to this procedure shall be performed in accordance with Reference 2.2.

5.0 INITIAL CONDITIONS

5.1 For resin disposal, the Spent Resin Transfer System is available for operation per OP-?-005, Reference 2.5.

5.2 For waste concentrator disposal, the Solid Waste Management System is available for operation per OP-7-006, Reference 2.4.

6.0 MATERIAL AND TEST EQUIPMENT

6.1 When using the Chem-Nuclear System, Inc. (CNSI) Mobile Cement Solidification System, obtain the material and test equipment as required in Reference 2.7.

6.2 When dewatering the CNSI disposable liners or HICs obtain the material and test equipment as required in Reference 2.8 or 2.9 as appro,riate.

6.3 When usi g the Hittman Nuclear Development Corp. (HNDC) Incontainer Solidification System, obtain the material and test equipment as required in Reference 2.10 or 2.11 as applicable.

6.4 When dewatering the HNDC disposable liners or HICs obtain the material and test equipment as required in Reference 2.12 or 2.13 as applicable.

7.0 ACCEPTANCE CRITERIA

7.1 SOLIDIFIED WASTE

7.1.1 Product resists puncture

7.1.2 No visible free-standing fluids

7.2 DEWATERED RESIN

7.2.1 CNSI - Less than 2000 ml pumped during final dewatering

7.2.2 HNDC - Literal compliance with Reference 2.12 or 2.13 as applicable.

7.3 RADIATION LEVELS

7.3.1 <150 mR/hr on the surface of the process shield

7.3.2 <8 mR/hr at 6 feet from the surface of the process shield

8.0 PROCEDURE

8.1 RESIN SOLIDIFICATION

8.1.1 When using the CNSI Mobile Cement Solidification System (MCSS) connect the Parker noncollapsable hoses from the 2 inch resin outlet flange and from the 1 1/2 inch dewatering inlet flange to the CNSI-MCSS plant connection stand.

8.1.2 When using the HNDC Incontainer Cement Solidification System connect the noncollapsable hoses from the 2 inch resin outlet flange and from the 1 1/2 inch dewatering inlet flange to the fill-divert valve.

8.1.3 Determine if a test solidification is required by reviewing the Radwaste Solidification Log (Attachment 10.1).

NOTE
Technical Specifications, References 2.1 and 2.2, require that a test solidification from each batch of waste be performed at least once every ten solidifications. If not required, proceed to step 8.1.7.

8.1.4 Place the Spent Resin Transfer System (SRTS) in recirculation in accordance with OP-7-005, Reference 2.5 and recirculate for 45 minutes.

CAUTION
Notify Health Physics for appropriate surveys during recirculation of the SRTS.

8.1.5 Obtain a resin sample for a test solidification as required by Reference 2.7 or 2.11 as applicable.

8.1.6 Secure the SRTS in accordance with OP-7-005, Reference 2.5.

8.1.7 Using the sample obtained in step 8.1.4, perform the test solidification in accordance with Reference 2.7 or 2.11 as applicable. Record results on the appropriate form and in the Radwaste Solidification Log (Attachment 10.1). Ensure the test results meet the Acceptance Criteria of section 7.1. If the Acceptance Criteria are not met, proceed to section 8.4.

8.1.8 The vendor solidification operator will calculate the amount of resin, cement, water, and other reagents required for solidification by completing the appropriate form.

NOTE
Assign a liner number in accordance with RW-2-320, Reference 2.14 and record on Attachment 10.1.

8.1.9 Place the SRTS in recirculation in accordance with OP-7-005, Reference 2.5. Recirculate for 45 minutes.

CAUTION
Notify Health Physics for appropriate surveys during recirculation of the SRTS.

8.1.10 Transfer resin to the liner in accordance with OP-7-005, Reference 2.5, until the predetermined amount of resin slurry has been transferred. Secure the SRTS.

CAUTION

Notify Health Physics for appropriate surveys during transfer to ensure the Acceptance Criteria of section 7.3 are not exceeded. If the Acceptance Criteria of 7.3 are exceeded, stop the solidification process and proceed to section 8.4.

NOTE

Dewatering may commence at the same time as resin transfer.

8.1.11 Dewater the liner in accordance with Reference 2.7 or 2.11.

8.1.12 Repeat steps 8.1.9, 8.1.10 and 8.1.11 until the predetermined amount of resin has been transferred and dewatered.

8.1.13 Secure the SRTS in accordance with Reference 2.5.

8.1.14 Solidify resin in accordance with Reference 2.7 or 2.11 as applicable. Enter the results in the Radwaste Solidification Log (Attachment 10.1) and on the appropriate form.

8.1.15 Remove the solidification equipment, and the Acceptance Criteria of section 7.1 shall be verified by QC. If the Acceptance Criteria are not met, proceed to section 8.4.

8.1.16 Remove the protective coverings from the shield and the trailer. Health Physics will verify that the smearable contamination on the external surface of the shield is less than 1000 dpm/100 cm^2. If not, decontaminate and resurvey as necessary.

8.1.17 Remove the process liner and store as directed by the Radwaste Supervisor.

8.1.18 Ensure all appropriate paper work is completed and routed to the Radwaste Supervisor for review.

8.2 WASTE CONCENTRATES SOLIDIFICATION

8.2.1 When using the CNSI-MCSS connect the Parker noncollapsable hoses from the 1 inch waste concentrate outlet flange to the CNSI-MCSS plant connection stand.

8.2.2 When using the HNDC Incontainer Cement Solidification System connect the noncallapsable hose from the 1 inch waste concentrate outlet flange to the fill-divert valve.

8.2.3 Determine if a test solidification is required by reviewing the Radwaste Solidification Log (Attachment 10.1).

NOTE
Technical Specifications, Reference 2.1 and 2.2, require that a test solidification from each batch of waste be performed at least once every ten solidifications. If not required, proceed to step 8.2.6.

8.2.4 Recirculate the Waste Concentrates Tank in accordance with OP-7-006, Reference 2.4, for (LATER) minutes.

CAUTION
Notify Health Physics for appropriate surveys during recirculation of the Waste Concentrate Tank.

8.2.5 Obtain a waste concentrate sample for a test solidification as required by Reference 2.7 or 2.10 as applicable.

8.2.6 Secure the SRTS in accordance with OP-7-006, Reference 2.4.

8.2.7 Using the sample obtained in step 8.2.4, perform the test solidification in accordance with Reference 2.7 or 2.10. Record results on the appropriate form and in the Radwaste Solidification Log (Attachment 10.1). Ensure the test results meet the Acceptance Criteria of section 7.1. If the Acceptance Criteria are not met, proceed to section 8.4.

8.2.8 The vendor solidification operator will calculate the amount of waste, cement, and other reagents required to perform solidification by completing the appropriate forms in accordance with Reference 2.7 or 2.10, as applicable.

NOTE
Assign a liner number in accordance with RW-2-320, Reference 2.14 and record on Attachment 10.1.

8.2.9 Recirculate the Waste Concentrates Tank in accordance with OP-7-006, Reference 2.4 for (LATER) minutes.

8.2.10 Transfer waste to liner in accordance with OP-7-006, Reference 2.4 until the desired amount of waste has been transferred. Secure waste concentrate transfer.

NOTE
Notify Health Physics for appropriate surveys during transfer to ensure the Acceptance Criteria of section 7.3 are not exceeded. If the Acceptance Criteria of 7.3 are exceeded, stop the solidification process and proceed to section 8.4.

8.2.11 Solidify waste in accordance with Reference 2.7 or 2.9, as applicable. Enter the results in the Radwaste Solidification Log (Attachment 10.1) and on the appropriate vendor forms.

8.2.12 Remove the solidification equipment, and the Acceptance Criteria of section 7.1 shall be verified by QC. If the Acceptance Criteria are not met, proceed to section 8.4.

8.2.13 Remove the protective coverings from the shield and the trailer. Health Physics will verify that the smearable contamination on the external surface of the shield is less than 100 dpm/100 cm^2. If not, decontaminate and resurvey as necessary.

8.2.14 Remove the process liner and store as directed by the Radwaste Supervisor.

8.2.15 Ensure all appropriate paper work is completed and routed to the Radwaste Supervisor for review.

8.3 RESIN DEWATERING

8.3.1 When using the CNSI Mobile Cement Solidification System (MCSS) connect the Parker noncollapsable hoses from the 2 inch resin outlet flange and from the 1 1/2 inch dewatering inlet flange to the CNSI-MCSS plant connection stand.

8.3.2 When using the HNDC Incontainer Cement Solidification System connect the noncallapsable hoses from the 2 inch resin outlet flange and from the 1 1/2 inch dewatering inlet flange to the fill-divert valve.

8.3.3 Place Spent Resin Transfer System (SRTS) in recirculation in accordance with Reference 2.5. Recirculate for 45 minutes.

CAUTION
Notify Health Physics for appropriate surveys during recirculation of the SRTS.

8.3.4 Transfer resin to the HIC or liner as approriate in accordance with OP-7-005, Reference 2.5.

CAUTION
Notify Health Physics for appropriate surveys during transfer to ensure the Acceptance Criteria of section 7.3 are not exceeded. If the Acceptance Criteria of 7.3 are exceeded, stop the transfer and proceed to section 8.4.

8.3.5 Commence dewatering the HIC or liner in accordance with Reference 2.8, 2.12, or 2 as applicable.

8.3.6 When the predetermined amount of resin has been transferred, secure the SRTS in accordance with OP-7-005, Reference 2.5.

8.3.7 Complete resin dewatering in accordance with References 2.8, 2.12, or 2 as applicable. Ensure applicable dewatering process forms are completed.

8.3.8 The applicable Acceptance Criteria of section 7.2 shall be verified with QC. Record the results on the appropriate forms. If the Acceptance Criteria is not met, proceed to section 8.4.2.

8.3.9 Enter dewatering results in the Resin Dewatering Log, Attachment 10.2.

NOTE
Assign a liner number in accordance with RW-2-320, Reference 2.14.

8.3.10 Remove dewatering equipment and seal the HIC or liner as applicable in accordance with the appropriate vendor user manual or procedure.

8.3.11 Remove the protective coverings from the shield and the trailer. Health Physics will verify that the smearable contamination on the external surface of the shield is less than 1000 dpm/100 cm^2. If not, decontaminate and resurvey as necessary.

8.3.12 Store the HIC or liner as directed by the Radwaste Supervisor.

8.3.13 Ensure all appropriate paper work is completed and routed to the Radwaste Supervisor for review.

8.4 UNACCEPTABLE CONDITIONS

8.4.1 Test Solidification

8.4.1.1 Obtain additional test samples in accordance with step 8.1.4 or 8.2.4, as applicable.

8.4.1.2 Perform the test solidification in accordance with step 8.1.6 or 8.2.6, as applicable, with alternative parameters allowed by the Vendor's Process Control Plan.

8.4.1.3 If the subsequent test solidification is acceptable, solidification of the batch of waste may then be resumed using the alternative solidification parameters determined in step 8.4.1.2.

8.4.1.4 When the initial test solidification from a batch of waste is unacceptable, test solidifications shall be performed for each consecutive batch of the same type of wet waste until at least three (3) consecutive test solidifications are acceptable.

8.4.2 Dewatering and Solidification Process

8.4.2.1 Record the unacceptable condition on the appropriate form.

8.4.2.2 Inform the Radwaste Engineer of the unacceptable condition.

8.4.2.3 Correct the unacceptable condition in accordance with the appropriate Process Control Plan.

8.4.3 Radiation Levels

8.4.3.1 Transfer the contents from the unacceptable liner to another liner in accordance with the appropriate Process Control Plan.

8.4.3.2 Inform the Radwaste Engineer of the unacceptable condition.

9.0 SETPOINTS

NONE

10.0 ATTACHMENTS

10.1 Radwaste Solidification Log

10.2 Resin Dewatering Log

11.0 COMMITMENTS AND REFERENCES

R TYPE
RI.32

RADWASTE SOLIDIFICATION LOG

TEST SOLIDIFICATION

DATE	SYSTEM COMPONENT	TYPE WASTE	RESULTS		VENDOR PCP	COMMENTS:
			LIQUID ml	SET		

LINER SOLIDIFICATION

SOLID NO	DATE	LINER NO	TYPE WASTE	RESULTS		VENDOR PCP	COMMENTS:
				LIQUID ml	RESISTS PUNCTURE		
1							
2							
3							
4							
5							
6							
7							
8							
9							

A TYPE
A 133

RESIN DEWATERING LOG

DATE	SYSTEM/ COMPONENT	LINER NO.	RESULTS	VENDOR PCP	COMMENTS